RESEARCHES REGARDING 2X5 HERRINGBONE MILKING ROOM IN DAIRY COWS

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Abstract

24 observations were made at various periods of time starting with December 10th, 2010 and ending on March 15th, 2011.The 24 observations are 12 observations in milking 1 (milking from 5^{00}-6^{30}) and 12 observations in milking 2 (milking from 16^{00}-17^{30}). The milked amount in every observation was between 82 and 88 cows. Animals with non-functional quarters of the mammary gland were excluded, as well as animals with exaggeratedly long times. The average access time of a series of 5 cows in milking sheds decreased from 6,8-7,0 minutes registered in the first 2 observations to 2.5 minute in the last observation from March 15th, 2011. The preparation time of a mammary gland decreased from 60 seconds, the main milker and the exchange milker gathering experience with the passing of time. If we consider a reform percentage of cows of se 33 %, the average of production losses to a pre-determined somatic cells is: (0.33 x production loss) + (0.07 x production loss of multiparous animals). A strict milking routine in which nipples cleaning and drying occur every 30 seconds, and milk units application at every 60 seconds from the beginning of stimulations causes an increase of milk production by 450 kg per lactation and results in a surplus of 320 l/cow/lactation.

Key words: milking shed; milking unit; mammary gland quarters; nipples, milk

The hygienic and composition quality of milk is a major problem. Milk has to correspond from qualitative point of view since milking. Untreated raw milk is achieved in an environment with increased contamination risks and physical, chemical and microbiologic pollution (Amos H.E., Kiser T., Loewentein M., 1985). Modern insurance and management systems of milk quality are the object of ISO 9000 standards. Total quality achievement in milk industry supposes first of all complete hygiene in all the stages specific to milk production.

MATERIAL AND METHOD

The Holstein Friza breed within Simnic Agricultural Research and Development Centre comes from the import made from Denmark in 1977. The potential for milk production is around 10.000 litres per lactation, with a fat percentage of 4.0 % and 3.45 % protein.

In 2010, in December HERRINGBONE (Brăduleț) 2x5 was commissioned with 10 milking stations, therefore passing from milking in a jug to centralized milking. The purpose of this research was to observe the efficiency of the milking room 2 x 5 Herringbone (10 milking stations) with cows placement in an angle of 30^0 expressed in kilograms of milked milk per hour.

The activities considered and timing: cows access in milking stands from the opening of the access gate to its closing (for 5 cows); nipples immersion in the pre-dip solution (timing in every cow); erasing and drying the skin of nipples and the ventral part of the udder (timing in every cow); milking units attachment and attachment duration (timing in every cow); checking complete milking and nipples immersion in post-dip solution (timing in every cow); animals removing from the milking stand (from the opening of the exit gate to its closing). Average times were calculated for every activity comprised in the milking procedure (Stelwagen K., 2001**)**. Milked milk was measured after every series of milking. The influence of the preparation time of the mammary gland for milking on milk ejection was expressed by the average flows of milked milk. The efficiency of milking room was expressed in kilograms of milked milk per hour and per milking station.

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excluded, as well as animals with exaggeratedly long times.

The results of every activity timing are presented in (table 1, chart 1).

Cows' access in the milking room was the activity for which long periods of time were recorded. Animals' familiarization in the new milking conditions lasted for almost 3 months.

The average access time of a series of 5 cows in milking sheds decreased from 6.8-7.0 minutes registered in the first 2 observations to 2,5 minute in the last observation from March 15th, 2011.

Table 1

Average timing

No.	Specification	Average time per milking											
		Observation number											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Cows access to the milking point (minutes/5 cows)	6.8	7.0	6.6	6.5	6.4	6.0	6.0	4.6	4.0	3.0	2.4	2.5
2	Removing 3-4 jets of the nipple (sec/cow)	20	20	20	20	18	18	16	16	14	12	10	10
3	Pre-dip immersion (sec/cow)	20	20	20	20	18	16	14	14	12	12	10	10
4	Nipples wiping and drying (sec/cow)	40	40	40	30	30	30	30	25	25	25	25	20
5	Milking units attachment (min/cow)	20	20	20	20	20	18	18	16	14	12	10	20
6	Average milking time (min/cow)	7.2	7.3	7.1	7.3	7.2	7.1	7.2	7.3	7.0	6.8	6.7	6.5
7	Post-dip checking and immersion (sec/cow)	50	50	50	50	40	40	30	30	30	20	25	20
8	Animals removing (sec/cow)	120	120	120	100	100	110	100	90	90	80	80	60
9	Other activities in series (min/cow)	1.5	1.4	1.5	1.5	1.7	2.0	1.5	1.4	1.5	1.6	1.5	1.5
10	Total time of milking /series (minutes)	19.0	20.2	20.1	19.6	19.0	18.1	18.1	16.4	16.5	14.1	13.1	13.0
11	Milked milk per series (kg)	101	107	114	110	117	111	117	115	118	109	111	108

Table 2

The influence of stimulation time on milk ejection

Observation number	No. of cows	Preparation time (seconds)	Average production of milk/milking (kg/cow)	Average milking time (minutes)	Average milk flow (kg/minute)
1	82	100	10.1	7.2	1.40
2	82	100	10.7	7.3	1.46
3	84	100	11.4	7.1	1.60
4	85	90	11.0	7.3	1.52
5	86	86	11.7	7.2	1.62
6	86	82	11.1	7.1	1.56
7	88	73	11.7	7.2	1.62
8	88	71	11.5	7.3	1.57
9	86	65	11.8	7.0	1.68
10	85	61	10.9	6.8	1.60
11	86	61	11.1	6.7	1.65
12	85	60	10.8	6.5	1.66

RESULTS AND DISCUSSIONS

The preparation time for 1-minute milking is enough for good ejection of milk for all animals irrespective of lactation stage. The integration of an automated milking units separation system avoids over-milking, and the lighting signal meant the end of the period of milking units connection (table 2). This time, from the connection of the milking unit to the lighting signal, will be defined as milking time. Milking time decreased from 7.2-7.3 minutes to 6.5 in the 12th observation.

The milk flow and milk production of the cow have significant impact on the milking room efficiency,(Stelwagen K., Knight C.H, 2001).

Based on the data resulted from these observations and measurements, the efficiency of the2 x 5 Heringbone room was calculated in the 12 observations expressed in kilograms of milk per milking station and per hour .

While gaining experience and standardizing the milking routine after 3 months, the amount of 50 kg milk per milking station and per hour was reached.

A strict milking routine in which nipples cleaning and drying occur every 30 seconds, and milk units application at every 60 seconds from the beginning of stimulations causes an increase of milk production by 450 kg per lactation and results in a surplus of 320 l/cow/lactation.

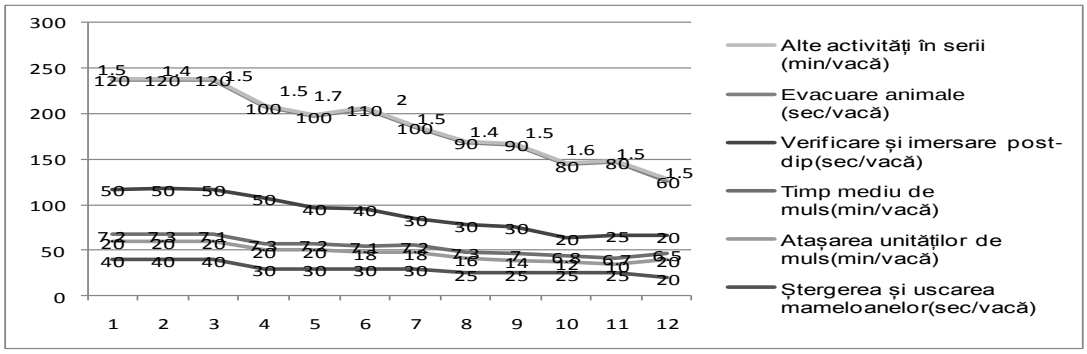

Figure 1 **Efficiency of the 2 x 5 herringbone miling room**

CONCLUSIONS

The study developed at Simnic Agricultural Research and Development Centre reveals the following conclusions:

The introduction of the Herringbone 2 x 5 centralized milking system with 10 milking stations provided the functionality of an efficient milking.

Filtration was made by using mechanic filtration during milking with once-only use filters.

Mammary stimulation of nipples and ventral pressure of the mammary gland for 30 seconds before attaching milking units is enough to get the efficient ejection of milk.

Milk ejection coordination with the attachment of milking units resulted in a large flow of milk and the decrease of time while milking units were attached.

Nipples and ventral part of the mammary gland hygienization reduces the risk of infections between milking.

By removing the first 3-4 jets of milk before attaching the milking units, the abnormal milk is practically eliminated, which does not have to reach the feedstock milk.

The standard milking routine provides the same treatment for every cow, in every cow, irrespective of the stage of lactation, the number of lactation or the person performing milking.

The average time while milking units were attached was below 6 minutes, being an optimal time, without implications on the integrity of the nipple channel. Extended milking is the cause of cones and infections of the nipple channels tissue.

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